

6. Budget Plan

TOBACCO INDUSTRY RESEARCH COMMITTEE
350 FIFTH AVENUE NEW YORK 1, N. Y.

Application For Research Grant

This application has been signed by Dr. Lee Burley, Director of Research and Development, Philip Morris Inc., and is submitted in his behalf. This application was received on July 26th, 1954 and will be given priority treatment according to the following schedule:

1. Name of Investigator: Dr. Lee Burley, M.D., Director of Research and Development, Philip Morris Inc.

Title: Professor of Medicine and Director, Cardio-Respiratory Laboratory, University of Southern California School of Medicine.

3. Institution: University of Southern California School of Medicine & Address: 1212 South State Street, Los Angeles 17, California.

4. Project or Subject: A Study of the Effects of Smoking on Pulmonary Function.

5. Detailed Plan of Procedure (Use reverse side if additional space is needed): The purpose of the proposed project is to determine by physiological measurements the nature and extent of the changes in pulmonary function measurements which may be induced as a result of inhalation of tobacco smoke. The pulmonary function status will be evaluated by a battery of physiological tests which have been shown to have a wide range between the normal and the abnormal and to provide reliable criteria of the ability of the individual to get oxygen in and carbon dioxide out adequately both during rest and exercise, and naturally occurring exposures to air pollution. The work is being carried on at present. The individuals to be studied will consist of essentially normal volunteers and patients with different types of chronic pulmonary diseases both at rest and under mild to moderate stress with exercise tests employing both the step-up test and the treadmill. The method of studying the effects of smoke can be measured either before and after smoking in the usual manner and in excess and from breathing air containing tobacco smoke. The type of measurements to be obtained include lung volume measurements from spirogram recordings of total vital capacity, timed vital capacity, and maximal breathing capacity before and after bronchodilator. The residual air volume is determined by the oxygen open circuit method and duplicate checks of 100 cc. or less are obtained on each case. The alveolar nitrogen determination is made after seven minutes of oxygen breathing. The exhaled N_2 curve is obtained after one deep breath of oxygen using the N_2 meter and the electrical recorder. Resting and exercise

10. Additional Information: None of my time is spent in other projects and other sources of funds.

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Application for Research Grant

Arterial blood samples are obtained and the oxygen content and capacity and CO_2 content determined on the Van Slyke manometric apparatus in duplicate. The arterial blood pH is determined on the Cambridge glass electrode. The hemoglobin is based on the oxygen capacity and spectrophotometric. Direct tension measurements of arterial blood oxygen and carbon dioxide using the Riley bubble method are performed. Direct recordings of blood pressure from the brachial artery including recording of the pressure pulse wave with the Statham gage and electronic pressure recorder. The pulmonary ventilation measurements include: resting and exercise measurements of respiratory rate, heartbeats, minute ventilation, oxygen uptake, carbon dioxide output and the percent of oxygen extracted from the inspired air breathed. A detailed study of the volume relationship of pulmonary ventilation to heart rate is also made. Detailed studies on the distribution of inspired gases by more precise methods of measurements is desired and is afforded by a mass spectrometer permitting the use of trace gases such as helium and carbon monoxide as indicated. The effect of bronchospasm on distribution of gases in the lungs, on pulmonary compliance and on the blood gas exchange in the alveoli appears to be an interesting aspect for investigation.

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ent at least \$1,000,000.00
to bondholders at the expense of supplies needed to run
the permanent equipment. A total of \$15,000.00

Overhead Research Grant Application 2,000.00
won \$1000 within six months of first application and no more than \$1,000.00
over a period of time to establish a bimonthly journal and to publish a number
of articles, reviews, notes and to maintain it as a bulletin service.
The journal will be called "Journal of the International Society for Feminist
Research".

7. Anticipated Duration of Work

The Cardio-Respiratory Laboratory of the University of Southern California School of Medicine is located in the Hospital of the Good Samaritan at 1212 Shatto Street, Los Angeles 17, California. This laboratory is set up and equipped for pulmonary function measurements, including bronchospirometry and cardiac catheterization, and includes the following equipment:
The Director of the laboratory is on a full time basis and is not engaged in private practice. One assistant (M.D.) and three technicians (C.R.T., R.N., and Respiratory Therapist) are employed. The Director has extensive publications since 1940.
Additional Requirements - Support is requested for two additional years. It is anticipated that the ensuing two years' budgets will be approximately \$20,000.00 in view of the fact that the purchase of any major items of equipment during the ensuing years will be unnecessary.

* Blood pressure, electrocardiograms, stethocardiograms, sputum

10. Additional Information (Including relation of work to other projects and other sources of supply):

The planned project is intimately concerned with the current activities of the Cardio-Respiratory Laboratory. Pulmonary function studies are being performed daily on patients with emphysema, pneumoconiosis, asthma, and similar medical diseases. In addition, pulmonary function studies are being carried out on pre- and post-operative patients in the field of pulmonary surgery. This will be coordinated by a unitary of respiratory disease. Our association with the Biologic Effects of Air Pollution project as mentioned above also provides experimental and clinical subjects for the study of respiratory function following experimental and naturally occurring exposure to air pollutants. This phase of the work is being supported as part of the Air Pollution study, and will consist of studies involving patients with different types of chronic pulmonary diseases both at part Attached is the Curriculum Vitae of the principal investigator and a list of his publications.

and we recommend either efforts and a clear smoking by the medical center and in all schools and from breathing air containing tobacco smoke. This type of experiments to be conducted for a long while to ascertain the health effects of smoking tobacco, alcohol, ether, vegetal smoke, and cigarette smoking. We hope that the烟霧和煙草的擴散器 will help to make the experiments more effective and will be used as much as possible by each烟霧. The吸烟者吸烟 Director of Project Signature Hurley L. Motley /s/

Signature Hurley L. Motley /s/
Director of Project

Business Officer of the Institution

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are employed in the Cardio-Respiratory laboratory and all are trained in the use of the Van Slyke in blood gas analysis and in the Scholander method of gas analysis. A full-time secretary is employed.

Included on the consultation staff is Dr. Paul Kotin and his entire staff now engaged in a full-time study of the Biologic Effects of Air Pollution. The studies include a determination of the acute, subacute, and chronic effects on animal species, clinical patients, and human volunteers.

Major Items of Permanent Equipment: 5 - Manometric Van Slykes; 3 - Scholander Gas Analyzers; 1 - Constant Temperature Water Bath Agitator and Equipment for Direct Tension Measurements of O₂ and CO₂; 1 - Cambridge pH Meter Glass Electrode, 1 - Sanborn Direct Writing Electrocardiograph, 1 - 13 liter Collins Respirometer, b2 - 120 liter Lissot type Gasometer; 2 - Sanborn Benedict & Roth type Metabolism Machines, 1 - Complete 3-channel Electrical Recorder for rates and pressure-volume relationships (pulmonary compliance); 2 - Bennett type Intermittent Positive Pressure Breathing Units equipped with air compressor and expiratory valve housing for collecting expired air; 1 - Residual Air Combination Valve Assemblies for the oxygen open circuit method; 1 - Beckman DU Model Spectrophotometer with Fisher Power Supply; 1 - International Centrifuge; 1 - Waters Conley Oximeter, double scale unit, with cuvette and earpiece; 1 - Waters Conley Nitrogen Meter, 1 - Beckman Oxygen Analyzer, 1 - portable treadmill and 1 - Fluoroscope.

00.500 Liston-Becker Model 16 CO₂ Analyzer with special Esterling-Anghus Recorder.

* blood pressures, electrocardiograms, stethocardiograms, airflow

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